

## **REMARKS**

Claims 34–44 are pending in the application. No claim amendments have been made. Following is Applicants’ response to the issues raised by the Examiner in the order in which they appear in the Office Action.

### **ART REJECTIONS**

In paragraph 2, the Office Action rejected claims 34–35 under 35 U.S.C. § 102(b) as allegedly being anticipated by United States Patent No. 4,068,276 to Pintell (“Pintell”). In paragraph 3, the Office Action also rejected claims 36–37 under 35 U.S.C. § 103(a) as allegedly being obvious over Pintell in view of United States Patent No. 4,949,214 to Spencer (“Spencer”). Finally, in paragraph 4, the Office Action rejected claims 38–44 under 35 U.S.C. § 103(a) as allegedly being obvious over Pintell in view of Spencer and United States Patent No. 5,185,684 to Beihoff *et al.* (“Beihoff”). Applicants respectfully traverse.

#### **1. THE CLAIMS ARE NOT ANTICIPATED BY PINTELL**

Independent claims 34, 40 and 44 are directed to electrical power fault detection and isolation apparatus comprising a sensor circuit that detects a transient, arc or ground fault by detecting the voltage drops across the main contacts capable of connecting a power supply to a load. Independent claims 41 and 43 are directed to methods of detecting a transient, arc or ground fault comprising the step of detecting the voltage drops across the main contacts connecting a power supply to a load. In particular, Applicants’ apparatus and methods involve detecting the small potential differences that can develop across the line connecting a power supply to a load in the event of a transient, arc or ground fault to detect the fault.

In rejecting the claims, the Office Action erroneously asserts that Pintell discloses “detecting one or more voltages across the main contacts” using Zener diodes 13 and 19. It is respectfully submitted that Pintell does not disclose detecting voltages across the main contacts. Rather, Pintell discloses a circuit that opens the contacts in the line wire based on the voltages measured between the line wire and the return (*i.e.*, neutral) wire, or between the line wire and the ground wire. *See* Pintell, *e.g.*, col. 1, lines 48-57; col. 2, line 50 – col. 3, line 4, and Fig. 1. In particular, the voltages across Zener diodes 13 and 19 are all based on the voltages between the line wire and the return (*i.e.*, neutral) wire, or between the line wire and the ground wire. *See* Pintell, *e.g.*, col. 1, lines 42-57. Indeed, while Pintell does identify

contacts in the line wire (*e.g.*, at col. 1, lines 42-47), the reference does not disclose or even suggest detecting the voltage drop across such contacts. *See* Pintell, *e.g.*, col. 1, lines 42-57. Therefore, Applicants submit that Pintell does not anticipate Applicants' claimed invention, at least for the reason that Pintell does not disclose "detecting one or more voltages across the main contacts."

Accordingly, for at least these reasons the claim rejections of under 35 U.S.C. § 102(b) over Pintell should be withdrawn.

The Office Action also erroneously contends that Pintell discloses a "tripping circuit [that] de-energizes the control relay in response to the faults detected." Applicants submit that Pintell does not contain any disclosure of de-energizing a circuit element in response to a fault detected. Rather, Pintell discloses an electronic switchover means that energizes an operating element of the safety device to open the contact in the event of a fault. *See* Pintell, *e.g.*, col. 1, lines 42-48. In particular, Pintell discloses that a substantial increase in the current fires the thyristor, which in turn energizes a coil to open the contacts in the line wire at the circuit breaker, which disconnects the load. *See* Pintell, *e.g.*, col. 2, lines 30-34. Pintell discloses that the over-voltage or under-voltage condition also causes the thyristor to fire, which energizes the coil to open the contacts at the circuit breaker. *See* Pintell, *e.g.*, col. 2, line 50 – col. 3, line 4. Thus, contrary to the express language of the rejected claims, Pintell's operating element is energized to open the circuit breaker in response to a fault. Therefore, Applicants submit that the Office Action is attributing to Pintell disclosure that it does not contain.

In view of the foregoing, Applicants respectfully request that the claim rejections under 35 U.S.C. § 102(b) over Pintell be withdrawn.

**2. THE CLAIMS ARE NOT OBVIOUS OVER PINTELL IN VIEW OF SPENCER**

The Office Action asserts that claims 36–37 are rendered obvious if Spencer's disclosure of a time delay circuit and a counting circuit is combined with Pintell's disclosure. As previously explained, Applicants' claimed invention is not anticipated by the disclosure in Pintell. Applicants submit that the combination of Pintell with Spencer suggested in the Office Action likewise does not render claims 36–37 obvious.

Spencer does not disclose an apparatus or method for detecting a transient, arc or ground fault by detecting the voltage drops across the main contacts. Rather, Spencer

discloses overload current detector circuits, where the circuit breaker is tripped in response to the magnitude of instantaneous *current* flow. *See, e.g.*, Spencer, Abstract. In one embodiment, a solenoid trips the circuit breaker when an excessive *current* flow through the load power conductor 40 causes a bimetallic strip to deflect, which breaks the contact between mechanical catch 32 and movable contact 30 of the breaker 12. *See, e.g.*, Spencer, col. 5, ll. 64-66 and col. 6, ll. 2-11. In an alternative embodiment, a ground fault interrupter trips the circuit breaker in response to small differences in the *current* flowing through the load power conductor 40 relative to the current flowing through the load neutral conductor 42. *See, e.g.*, Spencer, col. 11, ll. 3-11. As best as the reference is understood, Spencer has no suggestion, let alone disclosure, of detecting voltage drops across the main contacts, as recited in claim 34. Accordingly, Spencer does not cure the deficiencies in Pintell's disclosure, and Applicants respectfully submit that claims 36-37 are not obvious over Pintell in view of Spencer.

Accordingly, for at least these reasons the claim rejections under 35 U.S.C. § 103(a) over Pintell in view of Spencer should be withdrawn.

The Office Action also erroneously contends that Spencer discloses a time delay circuit that "isolates the sensor circuit from the main contacts during a predetermined time period after the control circuit connects the power supply to the load." However, Spencer does not use a time delay circuit to isolate the sensor circuit when power is supplied to the load, as recited in claim 36. In particular, Spencer uses a time delay circuit either for suppressing noise spikes (*see, e.g.*, Spencer, col. 7, ll. 16-18), or to activate the thermal circuit breaker to interrupt power distribution (*see, e.g.*, Spencer, col. 8, ll. 46-61). By contrast, Applicants' apparatus as defined in claim 36 isolates the sensor circuit from the main contacts during a predetermined time period after the power supply is connected to the load. There is no such disclosure in Spencer. Therefore, Applicants respectfully submit that claim 36 is not obvious over Pintell in combination with Spencer.

In view of the foregoing, the rejection of claims 36-37 under 35 U.S.C. § 103(a) over Pintell in view of Spencer should be withdrawn.

### **3. THE CLAIMS ARE NOT OBVIOUS OVER PINTELL IN VIEW OF SPENCER AND BEIHOFF**

The combination of Pintell with Spencer was considered above. Applicants submit that combining the teachings of Beihoff with those of Pintell and Spencer still does not arrive at or suggest Applicants' invention, as recited in claims 38-44. The Office has

cited Beihoff for the use of an optocoupler diode, and an AND gate. However, Beihoff does not cure the deficiencies in the combined teachings of Pintell and Spencer, because the reference contains no disclosure or suggestion of detecting one or more voltage drops across the main contacts. Therefore, Applicants respectfully submit that claims 38-44 are not obvious over Pintell in view of Spencer and Beihoff.

In view of the foregoing, the rejections of claim 38-44 under 35 U.S.C. § 103(a) over Pintell in view of Spencer and Beihoff should be withdrawn.

### CONCLUSION

Applicants respectfully request that the foregoing amendments and remarks be made of record in the file of the above-identified application. Applicants believe that each ground for rejection has been successfully overcome or obviated, and that all pending claims are in condition for allowance. Withdrawal of the Examiner's rejections, and allowance of the application, are respectfully requested. If any issues remain in connection herewith, the Examiner is respectfully invited to telephone the undersigned to discuss the same.

No fee is believed due in connection with this response. In the event that a fee is required, please charge any such fees to Jones Day Deposit Account No. 50-3013.

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Respectfully submitted,

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